

SELECTED DEVELOPMENTS IN WISCONSIN'S MINERAL INDUSTRY IN 1990

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Wisconsin mineral production

Wisconsin's nonfuel mineral production for 1990 is estimated at \$210 million; this would be the highest annual total in the state's history if the early estimated and preliminary production and value figures are correct. The U.S. Bureau of Mines collects mineral statistics for Wisconsin; the summary of the last three years of activity is shown in table 1. A review of table 1 shows that crushed stone remains the top-ranked mineral commodity produced in the state, followed by construction sand and gravel, industrial or specialty sand, and lime. All mineral production in 1990 was nonmetallic; no metallic minerals have been extracted in Wisconsin since 1983.

Actions with policy implications

Governor vetoes mining provisions. State legislation (AB 756/SB 362) was introduced late in 1989 to prohibit mining activity on certain land managed by the Wisconsin Department of Natural Resources (DNR). AB 756 received some legislative attention in the form of hearings and committee action, but neither it nor its companion bill, SB 362, received attention on the floor of the Assembly or Senate. However, in a last-minute amendment to SB 542 — the 1990 budget adjustment bill — the Legislature attached the substantive provisions of the two bills to the state budget. Governor Thompson vetoed this part of the budget bill, stating that the provisions in the legislation would "...take away the opportunity [for the DNR to consider requests] to allow mining on DNR-owned land when the mining would not cause injury to the environment or damage the integrity of the publicly owned land." The April 1990 veto was not overturned by the Legislature; new legislation (AB 27) was introduced in January 1991 to provide the same prohibition of mining on certain lands managed by the DNR.

Severed mineral rights lawsuit filed. A lawsuit was filed by Cornell University against Rusk County in an attempt to block the extinguishing of Cornell's severed mineral interests on land where the surface owner was tax delinquent. The county had taken ownership of a 160-acre parcel of land through a tax sale; the county asserted that in receiving a tax deed on the property, Cornell's severed mineral interests on that same property would be extinguished. The county cited previous opinions of the Attorney General in support of their contention regarding the effect of a tax deed on previously severed mineral interests. Cornell filed the suit to protect its ownership of the mineral rights and to have the previous Attorney General opinions invalidated or the laws on which the opinions are based declared unconstitutional. In 1990 the Circuit Court ruled in favor of Cornell University (Case No. 90 CV 25); however, an early 1991 appeal of the ruling will result in further deliberations before issues are resolved.

BCPL approves lease. The Board of Commissioners of Public Lands (BCPL), responsible for the management of state trust lands, leased a 160-acre parcel in the town of Enterprise (Oneida County) in February. This was the first such leasing action by the BCPL in its history. The BCPL manages about 80,000 acres of land for which it owns the surface and mineral rights and more than 100,000 acres of land for which it owns the mineral interests only. Later in the year, in response to several additional requests for leases on trust lands in Oneida and Price Counties, the BCPL requested that staff prepare a discussion paper on the policy options regarding further leasing actions and requested the development of criteria to guide the BCPL in making decisions on leasing requests. The criteria and options papers remained under review at the end of the year.

Nonmetallic mineral developments

Quartzite continues to be developed. As in 1989, the interest in crushed quartzite as a major stone product grew. In 1990 a proposal to expand the Lower Narrows operation (Sauk County) of Edward Kraemer and Sons, Inc., was denied by the Sauk County Board of Adjustments. The plans to expand an existing quarry onto the 40-acre parcel to the north (NW1/4, NW1/4, sec. 26, T12N, R7E) met with opposition from neighboring landowners and other interest groups, such as the Ice Age Trail Foundation. In its decision denying the special-exception permit, the Board noted the presence of quartzite reserves on the existing permitted quarry land and left open the possibility of using favorable operating experience with the existing operation as a guide to future consideration of a renewed application for a special-exception permit on the additional 40 acres. The proximity of the proposed Ice Age Trail to the Lower Narrows quarry has stimulated interest in, and some discussion of, acquisition by the Ice Age Trail Foundation of the northern 40 acres to preclude mineral development. In related action, Edward Kraemer and Sons, Inc., was successful in acquiring the necessary permits for reopening the old La Rue Quarry on the west end of the South Range of Baraboo Hills.

Interest in hard-rock aggregate grew with the development of a major quarry near Mosinee (Marathon County) by Mathy Construction Co. The expansion of operations at the quartzite quarry near Waterloo (Dodge County), operated by Gillen Construction Co., continued with the completion of a rail siding/loading facility.

Metallic mineral developments

Flambeau mine receives permits. After 3^{1/2} years of environmental assessment and permit reviews, Flambeau Mining Co. received all the permits necessary for its open-pit copper/gold mine along the Flambeau River just south of Ladysmith in (Rusk County (fig. 1). The final environmental impact statement was released in March and the Master Hearing began in July. The Master Hearing comprised two sessions of testimony: an initial public comment period and a contested-case hearing (followed by a second public comment session). The initial uncontested case testimony lasted three days and was characterized by strong opposition from those members of the public who addressed the Hearing Examiner. The contested case part of the hearing lasted almost three weeks, during which DNR staff provided testimony indicating that the environmental impact from the proposed mine would be limited and that the mine would be in full compliance with the state's rules and regulations.

On January 14, 1991, the hearing examiner issued the *Findings of Fact and Conclusions of Law* supporting his decision to grant all the permits at issue and to grant the four requests for exemptions sought by Flambeau Mining Co. A request by the Lac Court Oreilles Band of the Chippewa Nation to the Secretary of the DNR for an administrative review of the decision was denied. No judicial review of the decision was sought. Construction of the Flambeau Mine is expected to begin in the summer of 1991.

Noranda announces discovery of Lynne Deposit. In June Noranda Exploration Co. announced the discovery of significant mineralization in sec. 15, T37N, R4E (town of Lynne) in west-central Oneida County (fig. 1). Core from the discovery hole contained a mineralized interval that was 128 feet long and averaged more than 22 percent zinc.

The Lynne Deposit is now in predevelopment planning that will lead to the submission of a *Notice of Intent to Collect Data to Support a Mine-Permit Application* in mid-1991. The proposed mine project will be operated by Noranda Minerals Wisconsin Corp.

To date, Noranda Minerals has published the assay results of the first 67 drillholes. Preliminary analysis of the first 39 holes suggests that the deposit is slightly more than 6 million tons and averages 7.1 percent zinc, 1.84 percent lead, 0.34 percent copper, 3.08 ounces per ton of silver, and 0.013 ounces per ton of gold. The early indications are that the Lynne Deposit would be developed through open-pit mining.

Bend deposit planning begins. Jump River Joint Venture, a consortium of various companies active in exploration in Wisconsin in recent years, discovered a small copper/gold massive sulfide deposit in the Chequamegon National Forest of north-central Taylor County (fig. 1). The deposit (averaging 2.7 percent copper with 0.05 ounces per ton of gold in one zone and 0.27 percent copper with 0.13 ounces per ton of gold in another zone) is located in secs. 34 and 35, T33N, R2W (town of Westboro). The current owners of the rights to develop the deposit, subject to federal and state approvals, are NDU Resources (a Canadian mining company) and Chevron Resources. E.K. Lehmann and Associates has been the exploration company and its sister corporation, Wisconsin Mineral Resources, Inc. (now owned by NDU Resources), will be the operating company if the deposit is developed. The *Notice of Intent* for this 3.6 million ton deposit is expected in the summer of 1991. As with the Lynne Deposit, the submission of the *Notice of Intent* initiates what is expected to be a three- to four-year evaluation process by the state. With the Bend deposit, however, federal review will also be required before permission to develop a mine can be granted.

Leasing activity rises sharply. Leasing activity in 1990 was undertaken by only two companies: E.K. Lehmann and Associates of Wisconsin, Inc. (principally on behalf of or in conjunction with BHP-Utah) and Noranda Exploration, Inc. These companies leased more than 33,000 acres, the largest leasing activity since 1980. Leasing activity concentrated on Price County (particularly the east-central and south-central parts of the county) and the eastern part of the Proterozoic Penokean volcanic belt in Forest, Marinette, and Florence Counties. Future mineral leasing is expected in Marinette County on county forest land, as well as in scattered areas of Lincoln, Price, and Rusk Counties. Tables 2, 3, and 4 contain the 1990 metallic mineral leasing information.

Metallic mineral lease agreements in 1990 did not vary significantly from those of previous years. For option-to-purchase type agreements, the annual rentals ranged from \$5 to \$10 per acre per year or included a lump sum equal to 0.1 to 1 percent of the ultimate purchase price as an annual payment to maintain the agreement. These option-to-purchase agreements generally included a 1 to 2 percent net return royalty as a retained royalty held by the landowner after the property has been purchased. The scope of the net return royalty is usually delineated within the agreement. Straight mineral leases have annual rental payments of \$5 to \$7.50 per acre per year, with modest escalation into the \$12.50 to \$15.00 per acre per year range in subsequent lease years. One recent trend is toward leases with shorter lease terms (2 to 5 years as opposed to 10 years). Interestingly, the shorter-term agreements have given rise to the practice of re-signing agreements on property of sufficient interest to keep the lease in effect (but not resulting in an actual purchase). It is common now to see a lease on a property dropped (terminated) and then re-signed virtually within a matter of days.

In 1990 large acreage leases were common. Terms for such agreements, especially when the owner of the mineral interests is a private corporation, tend to be significantly higher than those signed with the owner of smaller parcels.

Exploration focuses on project evaluation. Exploration activity in 1990 focused almost entirely on evaluation of the Lynne and Bend massive-sulfide deposits. The record number of drillholes completed (72) included 68 holes that were constructed to "prove up" known deposits and are here considered development drilling (figs. 2 and 3). The first two drillholes on the Lynne property and two drillholes in the town of Enterprise (Oneida County) are the only holes considered true exploration drillholes in 1990. Because of the deposit-specific nature of exploration activity in 1990, only three companies actually were involved in drilling programs. Tables 5, 6, and 7 describe the 1990 exploration activity and the companies licensed to explore for metallic minerals during the year.

Table 1. Nonfuel mineral production in Wisconsin¹

Mineral	1988		1989		1990 ²	
	Quantity (in thousand short tons)	Value (in thousands of dollars)	Quantity (in thousand short tons)	Value (in thousands of dollars)	Quantity (in thousand short tons)	Value (in thousands of dollars)
Gem stones	NA	15	NA	W	NA	W
Lime	452	23,986	437	18,129	452	18,753
Peat	11	270	13	309	25	688
Sand and gravel						
Construction	25,048	60,080	21,700 ²	56,400 ²	28,000	76,400
Industrial	1,351	15,458	1,514	22,399	1,450	18,900
Stone						
Crushed	28,500 ^{2,3}	98,300 ^{2,3}	26,520	83,664	27,500	91,000
Dimension	49,900 ²	6,200 ²	35,587	4,376	31,316	3,811
Combined value of other industrial minerals and values indicated by symbol W	xx	564	xx	- ⁴	xx	- ⁴
Total	xx	204,873	xx	185,277 ⁵	xx	209,552 ⁵

NA=not available. W=withheld to avoid disclosing company proprietary data: value with "combined value" figure. xx=not applicable.

¹ Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

² Estimated.

³ Excludes certain stones: value included with "combined value" figure.

⁴ Value excluded to avoid disclosing company proprietary data.

⁵ Partial total excludes values that must be concealed to avoid disclosing company proprietary data.

Table 2. New acreage leased for metallic mineral exploration and acreage for which leases were terminated, by county and company, for 1990

County	E.K. Lehmann & Associates of Wisconsin, Inc.		Noranda Exploration, Inc.		Total acreage	
	Leased	Terminated ¹	Leased	Terminated ¹	Leased	Terminated ¹
Florence	-	-	5,724 ²	-	5,724 ²	-
Forest	-	-	2,440 ²	-	2,440 ²	-
Lincoln	1,434	624	-	-	1,434	624
Marathon	-	-	-	440	-	440
Marinette	-	-	1,154 ²	-	1,154 ²	-
Oneida	1,201	-	-	-	1,201	-
Price	20,550 ³	-	-	-	20,550 ³	-
Rusk	1,052	386	-	-	1,052	386
Total	24,237	1,010	9,318	440	33,555	1,450

¹ Figures represent total acres of leases terminated in 1990.

² Total shown represents the net acreage retained at end of the year; leasing of more acreage did occur, but leases for much of the same acreage were terminated within six months.

³ Figures include 1,371 acres of surface rights *only*.

Table 3. New mineral acreage contracted for leasing by year

Year	Metallic mineral transactions (total new acreage)	Oil and gas transactions (total new acreage)
1978	81,596	-
1979	16,417	-
1980	51,211	-
1981	29,465	-
1982	18,489	-
1983	14,099	24,002
1984	3,136	196,408
1985	1,270	479,012
1986	1,566	19,335
1987	10,122	18,029
1988	7,137	-
1989	19,524	-
1990	33,555	-

Table 4. New acreage¹ of metallic mineral transactions contracted since 1978, by county

County	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Total ²
Barron	-	-	20	-	-	-	-	-	-	-	-	-	-	20
Chippewa	-	-	-	-	1,000	160	407	160	-	-	-	-	-	1,727
Clark	-	-	-	400	-	-	-	-	-	-	-	-	-	400
Florence	41,296	720	15,132	2,063	474	1,950	480	-	-	-	-	-	5,724	67,839
Forest	18,402	3,825	19,780	7,111	1,760	700	311	-	-	-	-	-	2,440	54,329
Iron	-	765	400	70	554	9,080	-	-	-	-	-	-	-	10,860
Jackson	-	-	-	-	565	-	-	-	-	-	-	-	-	565
Langlade	80	3,120	200	333	719	-	-	-	-	-	-	-	-	4,452
Lincoln	-	-	679	3,071	1,660	515	660	689	344	40	470	885	1,434	10,447
Marathon	80	80	1,597	848	240	200	-	-	783	370	1,554	1,124	-	6,876
Marinette	14,707	2,052	-	-	160	-	-	-	-	-	-	-	1,154	18,073
Oconto	-	680	-	-	-	-	-	-	-	-	-	-	680	680
Oneida	400	480	640	1,487	1,905	-	160	421	-	80	-	12,929	1,201	19,703
Portage	-	380	-	-	-	-	-	-	-	-	-	-	-	380
Price	5,945	2,265	8,586	12,603	7,740	800	840	-	10	917	-	381	20,550	60,637
Rusk	35	1,143	2,939	1,119	-	-	-	-	0	1,105	4,164	826	1,052	12,383
Sawyer	-	-	758	-	640	-	-	-	-	-	-	-	-	1,398
Taylor	200	566	480	360	1,077	627	278	-	429	7,610	950	3,379	-	15,956
Vilas	-	-	-	-	-	67	-	-	-	-	-	-	-	67
Waushara	451	350	-	-	-	-	-	-	-	-	-	-	-	801
Total ²	81,596	16,417	51,211	29,456	18,494	14,099	3,136	1,270	1,566	10,122	7,137	19,524	33,555	287,592

¹ Only net new acreage leased is shown. Terminations of lease agreements are *not* included in table. Acreage totals do *not* indicate acreage currently under lease. Leases for most acreage shown for 1978-84 have been terminated by the mining companies.

² Numbers in columns may not add up to indicated total because of independent rounding of individual county figures.

Table 5. Five-year metallic mineral exploration summary

	1986	1987	1988	1989	1990
Companies licensed to drill ¹	11	10	9	8	8
Newly licensed companies ¹	2	1	1	0	1
Companies conducting drilling programs	4	3	5	4	3
Total counties with drilling activity	6	4	5	6	2
Total holes drilled	23	32	48	45	72
(development drilling) ²	(0)	(9)	(19)	(0)	(68)
Total footage drilled	15,480	20,220	23,577	26,937	35,875
(development drilling) ²	(0)	(2,324)	(2,258)	(0)	(33,582)
Total bedrock footage	13,390	17,710	19,697	23,935	30,862
(development drilling) ²	(0)	(338)	(1,239)	(0)	(28,887)

¹ An exploration license may be obtained at any time, but expires July 1st. These totals includes companies licensed all or part of the indicated calendar year.

² Numbers in parentheses refer to development drilling at sites of known mineral deposits. Totals include the figures listed for development drilling.

Table 6. Metallic mineral exploration by company and county, 1990

Company	Drillholes	Bedrock footage	Total footage
Chevron Resources Co.	2	889	1,092
E.K. Lehmann and Associates of Wisconsin, Inc.	4	5,213	5,902
Noranda Exploration, Inc.	66	24,760	28,881
Total	72	30,862	35,875
County			
Oneida	68	25,649	29,973
Taylor	4	5,213	5,902
Total	72	30,862	35,875

Table 7. Metallic mineral exploration licensees, 1990¹

License number	Company	License number	Company
1	Exxon Minerals Company	17	Kerr-McGee Resources Corporation ²
3	Noranda Exploration, Inc.	28	Utah International, Inc.
5	E.K. Lehmann and Associates of Wisconsin, Inc.	29	Chevron Resources Co.
		32	Placer Dome U.S., Inc.
9	American Copper and Nickel Co., Inc.	[33	Phelps Dodge Exploration East, Inc.] ³

¹ Companies listed were licensed to explore for metallic minerals in Wisconsin for all or part of 1990. License numbers not listed represent licenses issued previously to companies that did not renew their license for any part of the 1990 calendar year.

² License not renewed for July 1990 to June 1991 license year.

³ License actually granted January 1991; not included in totals in table 4.

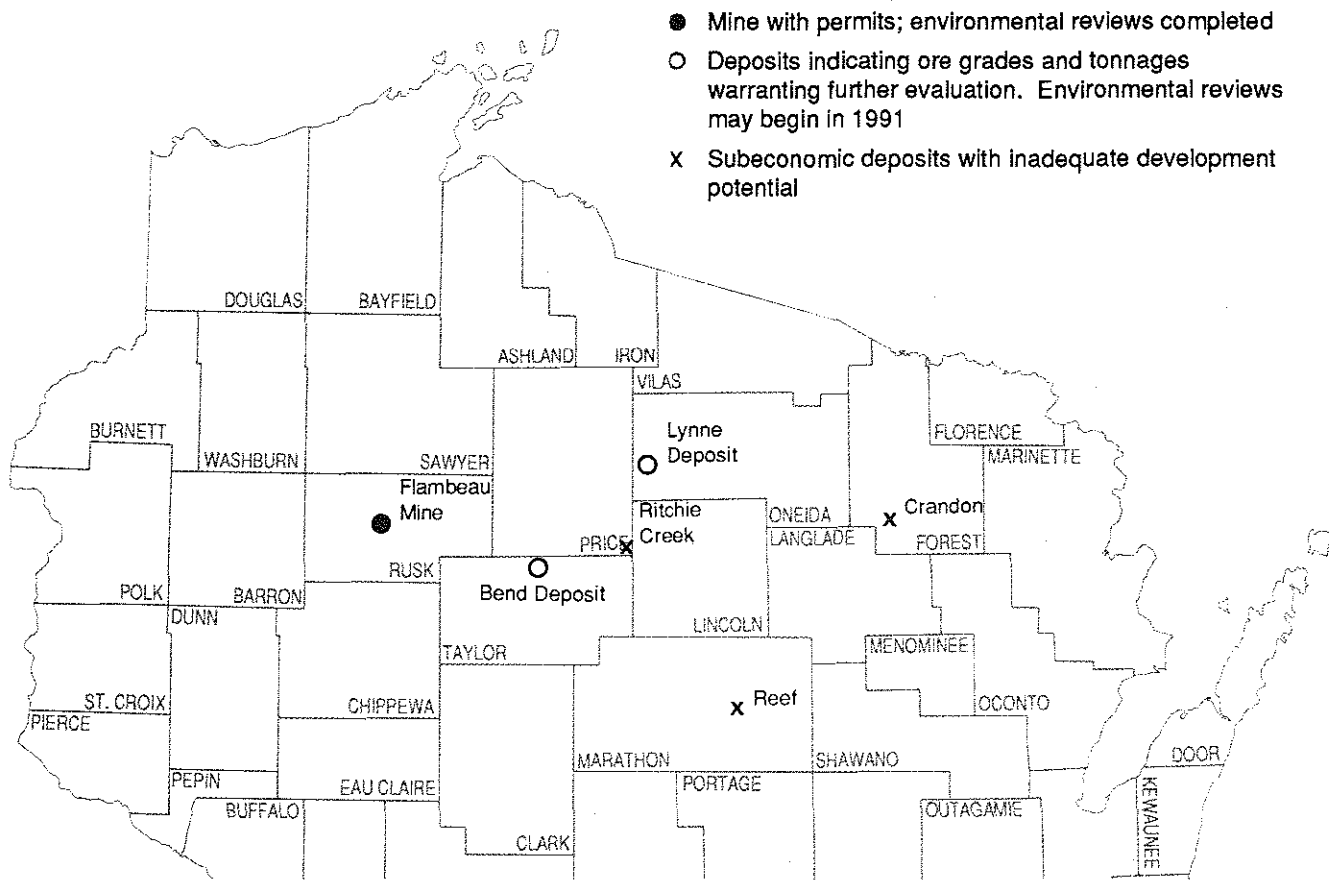


Figure 1. Sites of major metallic mineral projects in Wisconsin. Flambeau, Bend, and Lynne are discussed in text; in 1990 no activity occurred at the other sites indicated.

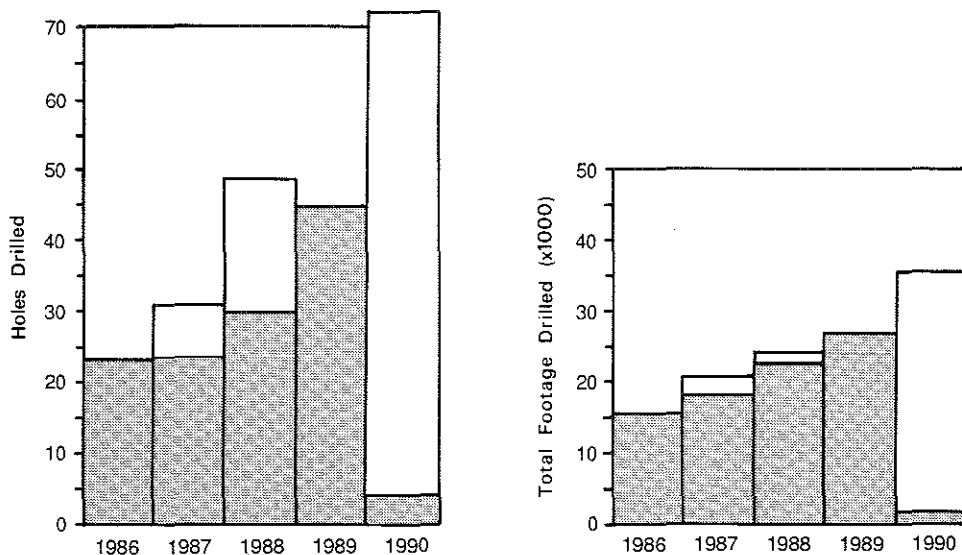


Figure 2. Exploration drilling in Wisconsin, 1986-90. Shaded part of bar graph represents exploration drilling; unshaded part represents development drilling on known mineral deposits.

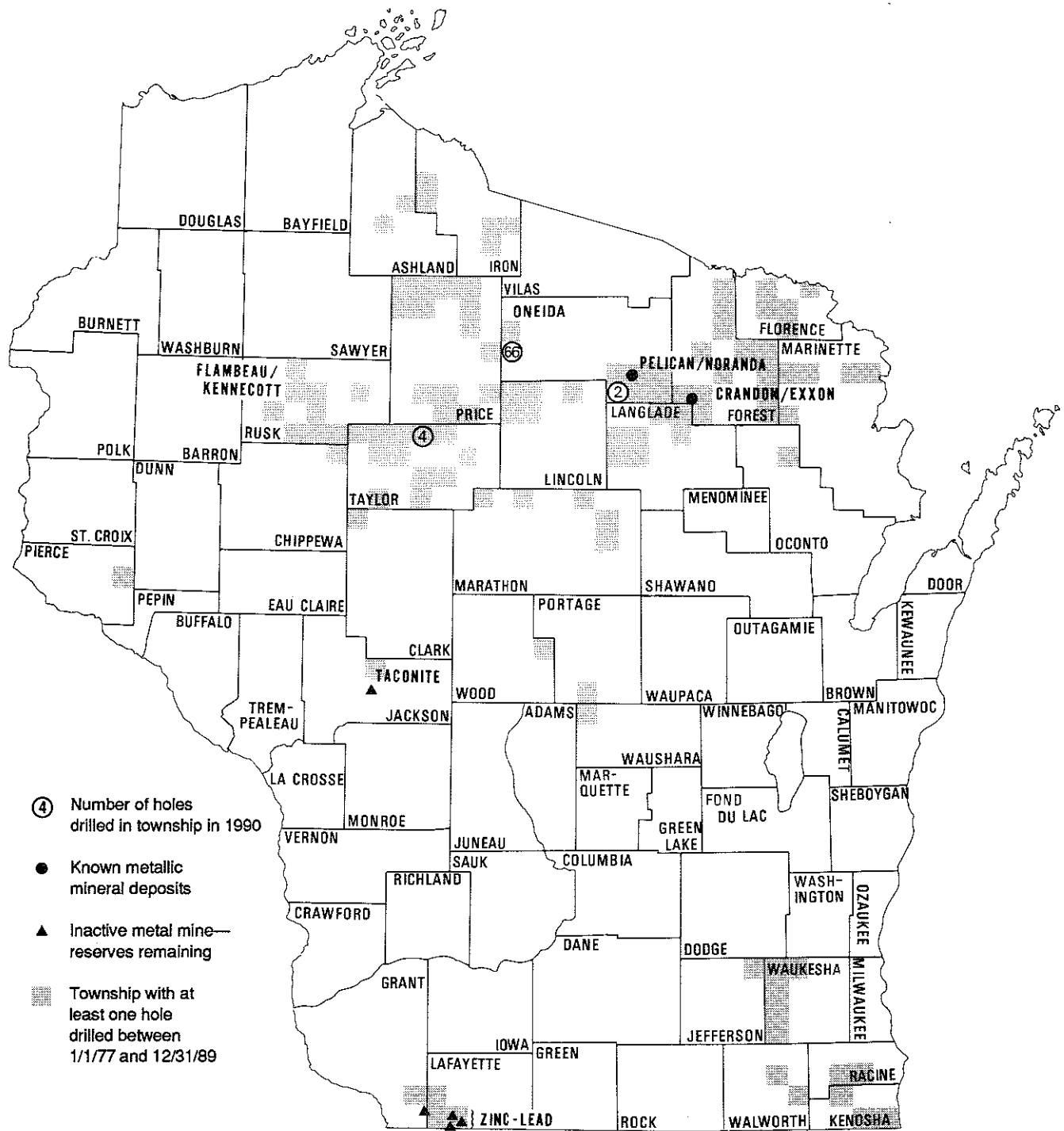


Figure 3. Metallic mineral exploration in Wisconsin, 1977-90. All drillhole data are from public records — drillhole abandonment reports submitted by metallic mineral exploration companies to the Wisconsin Department of Natural Resources.

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